Getting Started

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What's next ...

!   Take a hands-on tour of the Workbench

Walk through an existing project, start a simple project, and create a basic distributed project with detailed instructions in the *Hands On* guide. You access the *Hands On* guide from the Start menu of Windows by choosing **Programs**, then **ISaGRAF Enhanced**, then **Help**, then **Hands On**.

!   Play with the demos

Compile and simulate applications or view alarms notification by following detailed instructions in the "How to Use the Demos" section on page 2.

!   Study the architecture of **ISaGRAF Enhanced**

Curious to know how it's all put together? Explore the *Architecture Overview* presentation. You access the presentation from the Start menu of Windows by choosing **Programs**, then **ISaGRAF Enhanced**, then **Help**, then **Architecture**.

!   Setup a target (Windows NT, Linux-RTAI, QNX 6, or Windows CE)

Ready for a real control target? The easiest one to start with is Windows NT target but all four are discussed in the "Installation Procedures on Target Nodes" section on page 9.

!   Work with **ISaGRAF Enhanced**

Want to try some of the enhanced features of **ISaGRAF Enhanced**? Start by reading about them in the "Working with ISaGRAF Enhanced" section on page 31.

!   Consult the documentation

There is a lot more documentation. For more information, see "Documentation Set" on page 53.

How to Use the Demos

You can execute two application simulation demos that accompany **ISaGRAF Enhanced**. These demos, called *Demo* and *FermDemo*, were copied on your computer during the installation procedure. For *Demo*, you can walk through an existing project by following detailed instructions provided in the Hands On on-line manual. Another demo, *Alarms and Events*, running either on Windows NT or Windows 2000, displaying alarms and events notification, is also available if you installed Alarms and Events Management.

Note: The paths indicated for the demo procedures may differ if you installed **ISaGRAF Enhanced** components in a directory other than the default one.

To use the Demo demo

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Workbench**.

   The Workbench starts.

2. Open the PRJLIBRARY.MDB file in the following directory:
   My Projects\ISaGRAF Enhanced\Workbench\Prj\Demo\

3. Follow the instructions in the *Walking Through an Existing Project* section in the *Hands On* on-line manual, accessed from the Start menu by choosing **Programs**, then **ISaGRAF Enhanced**, then **Help**, then **Hands On**.

To use the fermentation demo

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Workbench**.

The Workbench starts.

2. Open the PRJLIBRARY.MDB file in the following directory:
My Projects\ISaGRAF Enhanced\Workbench\Prj\FermDemo\

3. In the Debug menu, choose **Simulation**.

The simulation begins. You can view variables and trace programs dynamically.

4. To use the OPC DA server:

    a) Minimize the Workbench window.

    b) If **ISaGRAF Enhanced** has been used previously, verify the VM OPC DA server's setup:

        i) In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **VM OPC DA Setup**.

        The VM OPC DA Setup window appears.

        ii) Make sure the Directory of Project File field is:
My Projects\ISaGRAF Enhanced\Workbench\Prj\FermDemo\

        iii) Close the VM OPC DA Setup program.

5. To use a HMI:

        i) Start the HMI and select the VM OPC DA server (Opcvirgo.OPCVirgoServer.1) as the data source.

        ii) Browse and use the project variables.

To use the alarms and events demo

To view the alarms and events demo, you need to install an Alarms and Events Notification Setup instance on the same Windows NT or Windows 2000 computer as the Alarms Server (logger). You must be logged on with administrator rights to start, stop, or configure the alarms server.

1. From the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Alarms,** then **Alarms Server**.

    The ISaGRAF Enhanced Alarm Service Control window appears.

2. In the Service Control window, click **Start Demo Mode**.

    The Alarms and Events Demonstration window appears.

3. Click **Start**.

    The Alarms and Events Notification Setup window appears.

4. From the View menu, choose **Active Alarm Summary**.

    The Active Alarm Summary viewer appears.

5. From the viewer's toolbar, click the **Connect** icon.

    The Select Alarm Server Window appears.

6. From the list of available servers, select the computer on which the alarms server is installed, then click **OK**.

Alarms begin to appear a few moments later. Without licensing the Alarms and Events System, the demo will only run for one hour.

ISaGRAF Enhanced **Overview**

ISaGRAF Enhanced is a complete automation suite combining design and operator interfaces on Windows platforms (Windows 98, Windows NT, Windows 2000, or Windows XP) with hard real-time control on target platforms. The suite is made up of two main modules:

! Workbench

! Run-time

Two HMIs are also available for use with **ISaGRAF Enhanced**. Figure 1 shows the main and other modules making up the **ISaGRAF Enhanced** environment. The suite offers trending, and alarms and events notification features as well as a failover mechanism. Using the WEB HMI Screen Builder, you can create screens, i.e., graphical user interfaces consisting of HTML pages with Java applets, from which you can monitor or run control processes either from a local computer or a remote location, i.e., via a network or the Internet. A data server gathers application data and relays it to Java applets on the screens. A web server provides the JAVA applet, screen definitions, and attached images to connected browsers.

Figure 1: The development and target environment.

Furthermore, using the VM OPC (OLE for Process Control) Data Access Automation Server, you can develop applications using programming languages such as Visual Basic, Visual C++, Java, and Delphi to communicate with targets through the VM OPC Data Access server.

Workbench

The Workbench is the environment in which you develop then monitor control applications, made up of resources, i.e., virtual machines at run time. These applications are made up of:

! I/O points and variables

! Control logic in any IEC-611131 language

! Field communications

! Alarms and events

! Trending

Since the Workbench is connected to the network making up the control system, once resources are developed, they can be downloaded to target nodes. Resources are made up of variables and IO points as well as programs developed using any of the five languages of the IEC 1131-3 standard or Flow Chart.

At run time, from the Workbench, you can monitor the state of virtual machines running on their target nodes. You can also choose to run an application in simulation mode.

Failover mechanisms, enabling a system to keep running in the event of a hardware or software failure, are also defined in Workbench applications.

Field communications, enabling communication between virtual machines and field equipment, can use one or more of many available drivers. A field communications manager, located on the target node, carries out field communications defined in the Workbench. Using a gateway, a software server that receives and handles requests from field

equipment through communication drivers, a target node can act as a slave. A driver monitor, running on the development platform, provides status and statistical information relating to drivers and other components of field communication.

You can receive notification of run-time system events from **ISaGRAF Enhanced** components such as the Workbench, VM OPC DA Server, HMI, and target nodes (run-time modules) using one of two methods: a basic logger and viewer or an alarms and events management system. The basic logger and viewer enable you to view and print system events. The alarms and events management system enables you to receive notification of system events, defined as alarms or events, using one of many viewers and action agents, i.e., numeric or alpha-numeric paging, telephone callout, audio annoucement, and many more. Furthermore, you can attach operator help files to messages appearing in the viewers.

Trending enables you to record and view real-time and historical values of variables defined in the Workbench. Trended data from the target node is relayed to the development platform, where it is stored and viewed using the Trend Link Control, an ActiveX that you insert in the HMI or other ActiveX container.

HMI

The HMI is the environment in which you create graphical user interfaces then interact with them. These interfaces are made up of built-in objects, ActiveXs, and basic drawing elements and their behaviors defined using predefined animations, VB scripts, and programs. From the HMI, you can access variables and IO points defined in the Workbench; the HMI and Workbench share a common database. At run time, the HMI updates the values of variables directly from the target nodes, through a high-speed connection using the VM OPC DA (Virtual Machine Ole for Process Control Data Access) server. **ISaGRAF Enhanced** supports most HMIs that can interface through an OPC server.

Run-time

The run-time module, running on a target node using a real-time operating system, is the link to the physical field equipment. This module executes the instructions contained in resources, downloaded from the Workbench. The run-time module holds many components: virtual machine, field communications manager, trends and alarms/events servers, and failover manager.

The virtual machine, a virtual PLC, reads variables and I/O points, executes your process control application, and writes to variables and I/O points in a cyclic loop.

The field communications manager starts and manages the gateway administrator and all communication drivers installed on a node. Drivers are used to interface with various field equipment using standard protocols.

The trends and alarms/events servers collect data from the field equipment then relay it to the development platform for storage and viewing purposes.

When a failover mechanism is defined, the failover managers, located on the specified primary and secondary target nodes, communicate constantly in order to determine the current status, active or standby, of the node on which they are located and to exchange current application data. The failover manager located on the standby node also stands ready to take over control in the event of failure of the active node.

Installation Procedures on Target Nodes

On target nodes, you need to install run-time modules. When using WEB HMI screens, developed with the WEB HMI Screen Builder, you also need to install WEB HMI data servers on the nodes where data is gathered. These installation procedures differ depending on the operating system used.

Windows NT Targets

Run-time modules enable your control applications, developed with **ISaGRAF Enhanced** on the development platform, to execute on Windows NT or Windows 2000 target nodes. For these operating systems, both the development platform and target node can be the same. The run-time modules form the containers into which the applications you built will be deployed.

Installing VM NT Run-time Modules

You install VM NT run-time modules onto target nodes from the **ISaGRAF Enhanced** CD-ROM by choosing the Windows NT Target option during the installation process. You install run-time modules on one target node at a time. Before using run-time modules, you need to license and start them. Licensing for run-time modules includes licensing for the WEB HMI data server. For details on licensing **ISaGRAF Enhanced** components, see page 64.

Note: Before installing run-time modules you need to disable the FTP server provided with the operating system. Run-time modules include an FTP server, automatically configured. You can choose to use the web server included with the run-time module or any other web server. WEB HMI data servers include a WEB server, automatically configured. To use the WEB server included in the run-time module, you must disable any others running on your computer. To use another WEB server, you need to remove the line holding the "HabWEB &" text from the

StartRuntime.lst file located in the ISaGRAF Enhanced\Run Time\Windows NT\bin folder, then set the root web folder of the web server to "app\hgapp" sub directory where the runtime is installed (Ex: ...\ISaGRAF Enhanced\Run Time\Windows NT\app\hgapp) so that the WEB HMI Screen Builder can download properly using default values.

When you install a new version of **ISaGRAF Enhanced**, you need to re-install the run-time modules.

To start a run-time module

You start VM NT run-time modules from their target nodes. WEB HMI data servers are automatically started.

► From the Start menu, choose **Program Files**, then **ISaGRAF Enhanced**, then **Windows NT Runtime**.

The run-time module is ready for use on the target node.

RTAI Linux Targets

Installing the RTAI Linux Operating System

In addition to the RTAI Linux operating system, you need the TCP/IP protocol which will allow communication between this real-time system and the Windows development platform.

Note: If you use the RTAI Linux installation CD-ROM provided by ICS Triplex ISaGRAF Inc, the TCP/IP protocol and all required packages are included.

To install the RTAI Linux operating system

1. Do one of the following:

   - If your target computer can boot from a CD-ROM, start the computer then insert the RTAI Linux installation CD-ROM in the CD-ROM drive and reboot.

     The installation process starts up displaying the Please insert wd 1.11 cdrom or root disk and press return prompt.

   - If your target computer is unable to boot from a CD-ROM, create a boot disk, then place it in the target computer's diskette drive and boot the computer, then when prompted to do so, insert the installation CD-ROM in the CD-ROM drive.

     For instructions on creating a boot disk, see the "To create a boot disk", on page 14.

2. Press **Enter**.

3. Install the required RTAI Linux components from the installation CD-ROM:

   a) Follow the on-screen instructions.

   b) When prompted to choose the location of the install source, choose **cdrom**.

---

c) Accept at least the following recommended packages:

- elvis
- gzip
- sh_utils
- tar
- package util

d) Accept at least the following optional packages:

- grep
- syslogd
- tcpip
- vim
- glibc2.2.2

e) When prompted for a domain name, type its name. If not using one, type `none`.

f) When prompted for a gateway, type its address. If not using one, type `1.1.1.1`

g) When asked to use a Nameserver, choose **No**.

h) When the installation is complete, remove the boot disk and installation CD-ROM from their respective drives, then press **OK**.

The target computer proceeds to booting from its hard disk.

4. Login to the computer as `root`:

a) At the login prompt, type `root` then press **Enter**.

b) At the password prompts, type the password defined in step 3, then press **Enter**.

5. Mount the CD-ROM drive:

   a) Insert the RTAI Linux installation CD-ROM in the CD-ROM drive.

   b) At the prompt, type the following line, then press **Enter**:
   ```
   mount /dev/cdrom /cdrom
   ```

   c) To go to the altersys directory, type the following line, then press **Enter**:
   ```
   cd /cdrom/ISaGRAF/
   ```

   d) At the new directory prompt, type the following line, then press **Enter**:
   ```
   ./install_script
   ```

6. To install RTNet (for use with a failover), when asked if you want to install it, choose y, then press **Enter**.

7. When asked to set the password for use with the run-time installer, type v2000, then press **Enter**.

8. When the setup is complete, remove the installation CD-ROM from its drive, then press **Enter**.

The computer restarts. If you chose to install RTNet, you need to set it up when the computer restarts. For details on setting up RTNet, refer to the *Using the RTNet Network to Link Target Nodes* application note.

If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

To create a boot disk

1. On a computer running a Windows operating system, place the RTAI Linux installation CD-ROM in the CD-ROM drive.

2. Insert a blank formatted floppy disk in the diskette drive.

3. In Windows Explorer, double-click the Rawrite.exe file in the following location:
   white_dwarf_linux-1.11\install

   A Command Prompt (MS-DOS Prompt for Windows 98) window appears.

4. When asked for a file name, type wdboot.img, then press Enter.

5. At the Enter target diskette drive prompt, type a: then press Enter.

6. Make sure the blank disk is in the diskette drive, then press Enter.

7. When the boot disk is completed, exit the Command Prompt window and remove the boot disk from the diskette drive.

The boot disk is created.

Installing or Updating RTAI Linux Run-time Modules

Run-time modules enable your control applications, developed with **ISaGRAF Enhanced** on the development platform, to execute on target nodes. They form the containers into which the applications you built will be deployed.

Installing the run-time modules means copying files from the Windows computer where **ISaGRAF Enhanced** is located to a target node. The file transfer is performed using the TCP/IP protocol. You install the run-time modules on one node at a time. You can also update, in a single step, all existing nodes on which the run-time modules have already been installed; if you choose this option, the user names and passwords of all nodes must be identical.

Note: When you install a new version of **ISaGRAF Enhanced**, you need to update run-time modules.

To install the run-time modules on a single node at a time

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Run-time Installation**, then **Install on One Node**.

   The Run-time Installation window appears.

2. In the fields, enter the required information for the target node.

Note: If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

3. In the Target Selector field, select the type of target (OS with or without FPU (Floating Point Unit)).

4. Click **Start**.

   The run-time modules are installed on the target node. This node is automatically restarted.

5. To install the modules on another target node, repeat steps 2 to 4.

6. To exit, click **Cancel**.

To update the run-time modules on all nodes

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Run-time Installation**, then **Install All**.

    The **ISaGRAF Enhanced** Run-time Installation window appears.

2. In the User Name and Password fields, enter the required information for the target node.

Note: If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

3. In the Target Selector field, select the type of targets (OS with or without FPU).

4. Click **Start**.

    The run-time modules are updated on the target nodes. These nodes are automatically restarted.

5. To exit, click **Cancel**.

Installing WEB HMI Data Servers

You install data servers using the *hibeam.v2k* file, sent to you following its purchase. Data servers can only run on computers having a FPU (Floating Point Unit).

Note: When using the WEB HMI data server, you can choose to use the web server included with the WEB HMI data server package or any other web server. WEB HMI data servers include a WEB server, which is automatically configured. To use the WEB server included in the run-time module, you must disable any others running on your computer. To use another WEB server, you need to remove the line holding the "HabWEB &" text from the "rc.M" file located in the "/etc/rc.d" folder, then set the root web folder of the web server to "/usr/v2000/app/hgapp" so that the WEB HMI Screen Builder can download properly using default values.

To install a WEB HMI data server on a target node

1. Copy the *hibeam.v2k* file in the Windows\Temp directory then double-click it.

2. In the **ISaGRAF Enhanced** Run-time Installation window, enter the required information for the target node.

Note: If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

3. In the Target Selector field, select the type of target (OS with FPU).

4. Click **Start**.

   The WEB HMI data server is installed onto the target node when the status bar, at the bottom of the window, reads Procedure completed.

5. To install a data server onto another target node, repeat steps 2 to 4.

6. To exit the Run-time Installation window, click **Cancel**.

QNX 6.2 Targets

Preparing QNX 6.2 for Run-time Module Installation

Before installing run-time modules onto a target where the QNX 6.2 operating system is installed, you need to prepare the target.

To prepare a QNX 6.2 target

Login as "root" onto QNX 6.2. If you are not automatically logged into Photon (QNX's GUI), you can launch Photon by typing "ph" in your console.

1. Make sure the *inetd* process is started:

    a) Type and execute the *sin* command to list all running processes and verify that the inetd process appears in the list. Type "sin | more" to view the list of running processes.

    b) If the *inetd* process appears in the list, proceed to step 2. Otherwise, edit the */etc/rc.d/rc.sysinit* file to enter the */usr/sbin/inetd* command before the *rc.local* script. You can launch the editor by typing "ped" in a console and browse for the required file.

2. Using the passwd utility, create a *Virgo2000* user setting the password to *v2000* and home directory to */usr/v2000*. type "passwd Virgo2000". Enter nothing for the User ID, Group ID, Real Name, Login Shell. Enter "/usr/v2000" as the Home directory and "v2000" as the New password.

3. Create a script file called /etc/rc.d/rc.local and set its attributes to make it executable. In this script, simply execute the /usr/v2000/sysinit.sh script that will be installed later by the runtime installer. type "ped /etc/rc.d/rc.local". Once the file is open, enter the following text:
/usr/v2000/sysinit.sh

Save (Alt-F, S) and exit (Alt-F, X) the editor and then type "chmod 777 /etc/rc.d/rc.local" in order to make this file executable.

4. Execute a "chmod a+s /bin/shutdown" to allow the installation script to reboot.

5. To avoid sending a welcome message that would disturb the runtime installer, delete the */etc/motd* file by typing "rm /etc/motd".

6. In the */etc/system/sysinit* file, add the following lines as indicated between the `# Start of additions` and `# End of additions` comments:

```
# Start the pipe manager. It is needed for
sub-shelling...
if ! test /dev/pipe -ef /dev/pipe; then
if pipe; then
typeset -i i=0
while test $i -lt 60 -a ! /dev/pipe -ef /dev/pipe ;
do
sleep 1;
let i=i+1;
done
unset i
fi
if ! test /dev/pipe -ef /dev/pipe; then
print Unable to start pipe manager...
exec sh
exec fesh
fi
fi
```

```
# Start of additions
--------------------------------------------------

# A way of running chkfsys at startup

if test 0$SAFEMODE -eq 0; then
if [ $# -eq 0 ]
then
# boot image does not pass parameters !!! Keep it
that way please

if test 0$VERBOSE -ge 1; then
echo "About to copy $0 to /dev/shmem"
fi
cp -v $0 /dev/shmem
exec /dev/shmem/$(basename $0) ramdisk
fi

if test 0$VERBOSE -ge 1; then
echo "Running $0 from /dev/shmem. About to chkfsys"
fi
# Now running from ram disk -- not the file system
being checked
/sbin/chkfsys -uPqr /
fi

# End of additions
--------------------------------------------------
---

# Start the POSIX message queue/named semaphore
manager
mqueue
```

7. When using the Failover (optional):

a) Activate the Qnet network by creating a file called */etc/system/config/useqnet*. To create the file, type "ped /etc/system/config/useqnet" then Save and Exit.

The contents of the file is not important, as long as the file exists.

b) Set the Qnet name of the machine in the */etc/net.cfg* file by typing "ped /etc/net.cfg". The Qnet name of the machine is located in the [Global] section of the file and is more specifically called "hostname". You can modify this name then Save and Exit.

c) Make sure that the parallel port manager process is not running. This process is called *devc-par* and is usually started by the */etc/system/enum/devices/char* script.

Type "ped /etc/system/enum/devices/char". If you find the following lines in this file, comment them out by placing a "#" symbol at the beginning of each these lines:

```
#device(pnpbios,              .type=$(PNPBIOS_TYPE_COMM),
.subtype=$(PNPBIOS_COMM_PARALLEL))
#device(isa,                  .type=$(ISA_TYPE_COMM),
.subtype=$(ISA_COMM_PARALLEL), .progif=00)
# tag(printer)
# append(legacy, ",nopar")
# uniq(parnum, devc-par, 1)
# driver(devc-par $(PAR_OPTIONS) -p0x$(ioport),)
# waitfor(/dev/par$(parnum))
# enumerator(par /dev/par$(parnum))
# use(symbolic=spooler path=/dev/par$(parnum))
```

Installing or Updating VM QNX Run-time Modules

Run-time modules enable your control applications, developed with **ISaGRAF Enhanced** on the development platform, to execute on target nodes. They form the containers into which the applications you built will be deployed.

Installing the run-time modules means copying files from the Windows computer where **ISaGRAF Enhanced** is located to a target node. You install the run-time modules on one node at a time. You can also update, in a single step, all existing nodes on which the run-time modules have already been installed; if you choose this option, the user names and passwords of all nodes must be identical.

Note: When you install a new version of **ISaGRAF Enhanced**, you need to update run-time modules.

To install the run-time modules on a single node at a time

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Run-time Installation**, then **Install on One Node**.

    The Run-time Installation window appears.

2. In the fields, enter the required information for the target node.

3. Click **Start**.

    The run-time modules are installed on the target node. This node is automatically restarted.

4. To install the modules on another target node, repeat steps 2 to 4.

5. To exit, click **Cancel**.

To update the run-time modules on all nodes

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Run-time Installation**, then **Install All**.

The **ISaGRAF Enhanced** Run-time Installation window appears.

2. In the User Name and Password fields, enter the required information for the target node.

3. Click **Start**.

The run-time modules are updated on the target nodes. These nodes are automatically restarted.

4. To exit, click **Cancel**.

Installing WEB HMI Data Servers

The WEB HMI data server, *hibeam.v2k* file, is sent to you following its purchase.

Note: Before installing the WEB HMI data server, you need to disable the WEB server provided with QNX. The WEB HMI data server includes a WEB server, automatically configured. You can choose to use any other web server. To use the WEB server included in the run-time module, you must disable any others running on your computer. To use another WEB server, you need to remove the line holding the "HabWEB &" text from the sysinit.{*node_number*} file located in the "/usr/v2000/sysinit.sh" folder, then set the root web folder of the web server to "/usr/v2000/app/hgapp" so that the WEB HMI Screen Builder can download properly using default values.

To install a WEB HMI data server on a target node

1. Copy the *hibeam.v2k* file in the Windows\Temp directory then double-click it.

2. In the **ISaGRAF Enhanced** Run-time Installation window, enter the required information for the target node.

3. Click **Start**.

   The WEB HMI data server is installed onto the target node when the status bar, at the bottom of the window, reads Procedure completed.

4. To install a data server onto another target node, repeat steps 2 to 4.

5. To exit the Run-time Installation window, click **Cancel**.

Windows CE Targets

Before installing CE runtime modules or WEB HMI data servers, you need to install Microsoft ActiveSync 3.0 on your development platform. The ActiveSync 3.0 program is available at the root of the **ISaGRAF Enhanced** CD-ROM in the ActiveSync 3.0 folder. To install it, double-click the Setup.exe program and follow the on-screen instructions. If you installed ActiveSync 3.0 after having installed ISaGRAF Enhanced CE components, you need to run batch files.

Note: You should install run-time modules and data servers in a folder other than the default installation folder. The default folder is located in the /Program Files folder which is usually removed each time you restart the device.

Before installing run-time modules you need to disable the FTP server provided with the operating system. Run-time modules include an FTP server, automatically configured. When using the WEB HMI data server, you can choose to use the web server included with the run-time module or any other web server. WEB HMI data servers include a WEB server, also automatically configured. To use the WEB server included in the run-time module, you must disable any others running on your computer. To use another WEB server, you need to rename or delete the "HabWEB.exe" file located in the "ISaGRAF Enhanced\bin" folder, then set the root web folder of the web server to "app\hgapp" sub directory where the runtime is installed (Ex: ...\ISaGRAF Enhanced\app\hgapp) so that the WEB HMI Screen Builder can download properly using default values.

On most Windows CE platforms, to ensure that the registry is placed in persistent storage, you may need to execute a utility provided by the device's manufacturer. For more information, refer to the manufacturer's documentation.

To use CE runtime modules on a platform not supporting ActiveSync 3.0 or to integrate them with a Windows CE image, contact Technical Support to obtain the necessary instructions and files. For details on contacting Technical Support, see page 66.

Installing CE Run-time Modules

CE run-time modules are started by executing the StartRunTime.exe program located in the VM Runtime\bin folder. However, this program is not started automatically. To start a run-time module automatically when the computer starts, refer to the device manufacturer's documentation.

To install the run-time module on a target node

If you installed ActiveSync 3.0 after having installed ISaGRAF Enhanced CE run-time modules, you need to run the ActiveSync_CE.bat batch file by double-clicking it. This file is located in the Program Files\ISaGRAF Enhanced\Windows CE PC\ directory.

1. On the development platform (Windows 98, Windows NT, or Windows 2000), install ActiveSync 3.0, then the CE run-time module.

2. Open the ActiveSync window by double-clicking its icon in the Status Notification Taskbar.

3. On the target node, start the *repllog.exe* program located in the \Windows\ directory until ActiveSync is connected to the target. If unable to connect to the target, refer to Microsoft's documentation.

4. On the development platform, from the ActiveSync window's Tool menu, choose **Add/Remove Programs**.

    The Add/Remove Programs window appears displaying the CE runtime module.

5. Select the run-time module.

Note: You cannot install run-time modules and WEB HMI data servers at the same time; data servers (HiBeam Runtimes) must be installed separately, after having installed the run-time modules.

6. To install the module in a location other than the default installation folder, uncheck **Install program into the default installation folder**.

7. Click **OK**.

8. If you chose to install the runtime module in a location other than the default installation, in the Destination Folder window, choose the location in which to install it, then click **OK**.

9. Follow the on-screen instructions.

10. Make sure to save the registry to persistent storage.

Uninstalling CE Run-time Modules

You need to uninstall CE run-time modules before updating them.

To uninstall CE run-time modules

1. Locate and copy the UninstallVMRuntime.exe program in the VM Runtime\bin folder.

2. Paste the program in the \Temp folder.

3. Double-click the program.

4. Make sure to save the registry to persistent storage.

The CE run-time module is uninstalled.

Installing WEB HMI Data Servers

Before installing a WEB HMI data server on a target node, you need to install a run-time module. Furthermore, if you installed ActiveSync 3.0 after having installed CE WEB HMI data servers, you need to run the ActiveSync_DataServer_CE.bat batch file by double-clicking it. This file is located in the Program Files\ISaGRAF Enhanced\Windows CE PC\ directory.

You need to disable the embedded WEB server, sometimes included with Windows CE, that is automatically started. The WEB HMI data server includes a WEB server for use in its place.

To install a WEB HMI data server on a target node

1. On the development platform, open the ActiveSync window by double-clicking its icon in the Status Notification Taskbar.

2. On the target node, start the *repllog.exe* program located in the \Windows\ directory.

3. On the development platform, from the ActiveSync window's Tool menu, choose **Add/Remove Programs**.

    The Add/Remove Programs window appears displaying the HiBeam Runtime.

4. Select HiBeam Runtime.

5. To install the runtime in a location other than the default installation folder, uncheck **Install program into the default installation folder**.

6. Click **OK**.

7. If you chose to install the runtime module in a location other than the default installation, in the Destination Folder window, choose the location in which to install it, then click **OK**.

8. Follow the on-screen instructions.

9. Make sure to save the registry to persistent storage.

Driver Installation

You can send drivers onto your target nodes after having installed the run-time modules. Driver files, having the .v2k extension, are sent to you following their purchase. For Windows NT and Windows 2000 targets, you need to license the drivers. For details on licensing **ISaGRAF Enhanced** components, see page 64.

Note: For details on the availability of drivers for the different target operating systems, contact ICS Triplex ISaGRAF Inc' sales personnel. For details on contacting sales, see page 66.

Documentation for all drivers is copied onto your Windows disk during **ISaGRAF Enhanced**'s installation, in the following directory:
Program Files\ISaGRAF Enhanced\Documentation\Drivers.

To install a driver on a target node

1. Copy the .v2k file corresponding to the driver into the Windows\Temp directory then double-click it.

    The **ISaGRAF Enhanced** Run-time Installation window appears.

2. In the fields, enter the required information for the target node.

Note: If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

3. Click **Start**.

    The driver is installed onto the target node when the status bar, at the bottom of the window, reads Procedure completed.

4. To install the driver onto another target node, repeat steps 2 and 3.

5. To exit, click **Cancel**.

Working with ISaGRAF Enhanced

When working with **ISaGRAF Enhanced**, you develop applications on a Windows platform (Windows 98, Windows NT, and Windows 2000) then run them on target nodes running on real-time operating systems. For Windows 2000, you need to have Power User group priveleges.

Workbench

The development process of a control application consists of creating projects made up of configurations, representing individual target nodes, on which one or more instances of resources, i.e., virtual machines, are downloaded. At run time, the virtual machines run on these target nodes.

In the Workbench environment, you set up many aspects of your application:

! Run-time system events logging

! Field communications

! Trending

! Failover mechanisms

To start the Workbench

➤ In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Workbench**.

For guidance on creating Workbench applications, you can walk through an existing application while viewing the *Demo* demo and following the instructions provided in the *Hands On* on-line manual. You access the Hands On manual from the Start menu of Windows by choosing **Programs**, then **ISaGRAF Enhanced**, then **Help**, then **Hands On**.

Setting up Run-time System Events Logging

In **ISaGRAF Enhanced**, the basic logger and viewer are readily available. Before using the basic logger, you need to set it up. Run-time system events will automatically appear in the viewer.

For alarms and events management, in addition to receiving run-time system events, you can set up alarms and events for certain Boolean-type and numerical-type variables defined in the Workbench. More specifically, these variables include BOOL, DINT, REAL, FLDIOBOOL, FLDIODINT, and FLDIOREAL types. You can define actions for individual alarms and events.

You view the current state of alarms in both the Active Alarm Summary and Alarm History viewers. However, events and historical alarms appear in the Alarm History viewer. You can also view the status of active actions in the Actions Summary viewer and completed actions in the Actions History viewer.

For targets using the QNX or Windows CE operating systems, you can view target run-time system events in an error log. For information on using an error log, refer to the *Starting a Run-time Error Log* application note.

To set up basic events logging

1. From the Tools menu, choose **Events Logger Selection**.

    The Select Events Logger window appears offering the choice of Full Alarms/Events or Basic Viewer (available when events are enabled in a Workbench project).

2. Choose **Basic Viewer**, then click **Close**.

3. From the Tools menu, choose **Events Logger Setup**.

    The Events Logger Service Control window appears.

4. To change the location of the log file, click **Log File Directory**.

Note: The log file directory and project path are defined for the computer.

5. Locate the folder in which to save the log, then click **OK**.

6. To change the location of the project, click **Project Path**.

7. Choose a logger startup option then click **Apply**.

8. Do one of the following:

   - If you chose the Manual startup option, click **Start Events Logger**, then **Close**.

   - If you chose the Automatic startup option, click **Close** then restart the computer.

9. To view events, do one of the following:

   - From the Start menu, choose **Programs**, then **ISaGRAF Enhanced**, then **Events Viewer**.

   - In the Workbench, from the Tools menu, choose **Events Viewer**.

Run-time system events automatically appear in the basic viewer.

To set up alarms and events management

Before setting up alarms and events, you need to set up an alarms server (logger) on a Windows NT or Windows 2000 platform. On the alarm server's computer, you need to define a user for each Alarms and Events Notification (client) instance running on a remote computer.

When defining users for alarms and events management, you need to log onto the computer as Administrator, having all privileges, in the workgroup, not the domain. The Administrator is automatically created. However, new users must have previously defined user accounts for Windows NT or Windows 2000 before creating them.

The administrator can start and stop the alarms server (logger). Whereas, users can hold whatever privileges are specified for their assigned user groups.

1. Start the alarms server (logger):

   a) In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Alarms**, then **Alarms Server**.

   The Alarms Service Control window appears.

   b) Verify the alarms project path.

Note: Each alarms project is associated to a single Workbench project.

   c) In the Service Startup Options section, choose a startup mode, then click **Apply**:

   ▪ If the Manual Startup mode has been selected, in the Manual Server Startup section, click Start Server, then click **OK**.

   ▪ If the Automatic Startup mode has been selected, click **OK**, then restart the computer.

   The alarms server (logger) is running.

2. Set the alarms and events management for use with the running alarms server:

   a) In the Workbench, from the Tools menu, choose **Events Logger Selection**.

   The Select Events Logger window appears.

   b) Choose the **Full Alarms/Events** option.

   c) In the Primary section, specify the server on which the alarms server is running:

   ▪ Enter the name or address of the server.

   ▪ Choose the server from the list of registered servers.

   d) Click **Connect**.

   e) To enable a secondary alarms server, in the secondary section, check **Enable**, then enter the required information.

3. Configure the Alarms and Events Notification (client) instance to receive alarms and events from the alarms server:

   a) In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Alarms**, then **Alarms and Events Notification Setup**.

   The Alarms and Events Notification Setup window appears.

   b) From the Window menu, choose **Configuration**.

   The Configuration window appears.

   c) In the Which Server Would You Like to Configure? section, click **New**.

   The Select Alarms Server window appears.

d) Indicate the server name or address or choose one from the list of available servers, then click **OK**.

The Alarms and Events Notification (client) instance is ready to receive alarms and events notifications.

4. Define users for the alarms and events system:

   a) In the Alarms and Events Notification window, in the Administration section, click **Users and Zones**.

   The Accounts and Zones for Alarms Server window appears.

   b) Click **New User**.

   c) In the New User Name field, enter the new name, then click **OK**.

   The Select Alarms Server User Group window appears.

   d) From the list of groups, select a user group, then click **OK**.

   e) Repeat steps b to d to create as many users as required, then click **Done**.

5. In the Workbench, set up alarms and events for variables:

   a) From the Project menu, choose **Variables**.

   b) In the Dictionary view, right-click.

   c) From the contextual menu, choose **Advanced Options**.

   The Advanced Options window appears.

   d) Select the alarm or event tab corresponding to the type of variable for which to configure an alarm or event.

e) In the browser, select the variable.

f) In the editor fields, enter the required information.

6. To view alarms and events, in the Alarms and Events Notification Setup window, from the View menu, select the desired viewer.

Setting up Field Communications

Field communications defines the structure required by target nodes to allow communication between the virtual machines and remote equipment. You need to perform such an operation for all target nodes, included in your control project.

For each configuration in your project, you need to set up a Field Communications Manager. For variables, you need to define communication drivers, then field equipment, then devices, then finally I/Os. This hierarchically-structured information is stored in the database created for the control project. The defined structure will be downloaded to the target nodes with the project's configuration files.

ISaGRAF Enhanced includes the Driver Monitor enabling you, at run time, to look up status and statistics information for field communication elements on target nodes.

To set up a field communications manager

1. From the Workbench's Window menu, choose *project_name*-**Hardware Architecture**.

    The Hardware Architecture view appears displaying configurations defined for the project.

2. For a configuration requiring field communications, right-click in its title bar.

3. From the contextual menu, choose **Advanced Options**.

    The Advanced Options window appears.

4. Select the Field Communications Manager tab.

5. In the editor fields, enter the required information.

To set up field communications

You set up field communications from the Workbench's link or hardware architecture views when a resource is selected.

1. From the Project menu, choose **I/O Wiring**.

   The I/O Points editor appears.

   The first time you open field communications for a configuration, an empty structure is displayed in the browser. This structure consists of one communication driver, one instance of field equipment, one device, and one I/O.

2. Set up the field communications structure. Right-clicking each element in the browser accesses its contextual menu.

   a) For each configuration, create as many communication drivers as required. For each communication driver, you need to specify a fieldbus protocol.

   b) For each communication driver, create as many field equipment entries as required.

   c) For each instance of field equipment, create as many devices as required.

   d) For each device, create as many I/Os as required (maximum 256 I/Os per device). For each I/O, you must specify an access method, representing the I/O's physical address.

To start the Driver Monitor

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Driver Monitor**.

   The **ISaGRAF Enhanced** Driver Monitor appears.

2. In the File menu, choose **Open Project**.

   The Choose the Project Database window appears.

3. In the file browser, select the PRJLIBRARY.MDB file located in the following directory:
My Projects\ISaGRAF Enhanced\Workbench\Prj*project_name*; then click **Open**.

The field communication components defined for the project appear in the browser.

4. In the browser, select a field communication item.

The display field holding the status or statistical information for the item appears.

Setting up Trending

Trending enables you to record a system's behavior in order to allow subsequent analysis and identification of problems. In **ISaGRAF Enhanced**, variables configured in the Workbench can be trended, i.e., their changes of values are recorded. However, to view a graphical representation of trends, you need a trends viewer. In **ISaGRAF Enhanced**, the viewer is the Trend Link Control, an ActiveX object, that you insert in the HMI.

Before starting historical trending, you need to set up a trends server then start the Trends Logger.

To enable trending and set up a trends server

1. From the Workbench's Window menu, choose *project_name*-**Hardware Architecture**.

2. For a configuration having variables to be trended, right-click in its window title bar.

3. From the contextual menu, select **Advanced Options**.

    The Advanced Options window appears.

4. Select the Trends Server tab.

5. To enable trending, check **Enable Trending**.

6. To set up a trends server, in the remaining fields, enter the required information.

To start the Trends Logger

The first time you start the trends logger, you will need to specify the Project Path and Trends Directory fields.

➤   In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Trends Logger**.

The Trends Logger icon appears in the Windows task bar. Clicking it accesses the Trends Logger window.

To set up trending

To specify trending, you need to have defined variables in your project.

Note: You need to enable trending before proceeding to defining trends for variables.

1.   From the Project menu, choose **Variables**.

2.   In the Dictionary view, right-click.

3.   From the contextual menu, select **Advanced Options**.

     The Advanced Options window appears.

4.   Select the Trends tab.

5.   In the browser, select a variable to be trended.

6.   In the editor fields, enter the required information.

To start a trends viewer

1. In the HMI, enable the **ISaGRAF Enhanced** Trend Link Control as an ActiveX control:

    a) From the Tools menu, choose **Preferences**, then **ActiveX Controls**.

        The ActiveX Controls Configuration window appears.

    b) From the installed ActiveX Controls browser, select Trend Link Control, then click >>.

        The Trend Link Control moves to the Approved ActiveX Controls browser.

    c) Click **OK**.

2. While in Design mode, from the Insert menu, choose **ActiveX Control**.

3. From the ActiveX window, select **ISaGRAF Enhanced Trend Link Control**.

Setting up Failover Mechanisms

Failover mechanisms use a primary and secondary node, one set as active and the other as standby, where the standby node stands ready to take over in the event of a hardware or software failure. Only one node can be active at any time. The primary node is automatically set as active and the secondary node as standby.

Note: Failover mechanisms may not be compatible with all communication drivers. For information on which drivers are compatible, contact Technical Support. For details on contacting Technical Support, see page 66.

You indicate an IP address and node number for the secondary node. You can choose to use one of two communications methods: Parallel port or Field bus link.

The default communication method is parallel port. The default value for the parallel port base (LPT1) address is 378 (Address in Hex). When using the fieldbus link, you need to select the I/O points that will be used for the inputs and outputs of each node. Furthermore, you need to specify the Sync Timeout, indicating the maximum time allowed for the transfer of data between the active and standby nodes. For both communication methods, you need to specify a heartbeat cycle, indicating the cycle time for the failover mechanism.

Using the FAILOVER function, you can perform many operations relating to the fail-over properties of a target node such as setting an active node to standby, causing the other to become active.

To set up a failover

1. From the Workbench's Window menu, choose *project_name*-**Hardware Architecture**.

2. Right-click the title bar of a configuration.

3. From the contextual menu, choose **Advanced Options**.

    The Advanced Options window appears.

4. Select the Failover tab.

5. In the fields, enter the required information.

OPC DA Server

The ISaGRAF Enhanced OPC (OLE for Process Control) Data Access server is a software module that standardizes communication to field equipment. A setup program enables you to establish a link between an ISaGRAF Enhanced OPC DA server and a project created in the Workbench, so that a HMI can have access to the project configuration data.

Note: There can be only one ISaGRAF Enhanced OPC DA server per computer. An OPC DA server can have many OPC clients.

An OPC Data Access Automation Server allows custom compliant applications built using programming languages such as Visual Basic, Visual C++, Java, and Delphi to communicate with targets through the VM OPC Data Access server. In other words, the automation server is an intermediary between the Dispatch-Interface compliant application and the VM OPC Data Access server.

For more information on setting up or using the OPC DA Server or OPC Data Access Automation Server, refer to the online documentation.

WEB HMI Screen Builder

In the WEB HMI Screen Builder, you build screens, using graphic objects arranged together in a document and linked to Workbench variables, then compile them into a HTML format with Java applets. You then download screens onto nodes, running a Java technology-enabled browser, i.e., Internet Explorer, Netscape Navigator. The Java applets on the screens communicate with WEB HMI data servers running on one or more target nodes where configurations having variables to be accessed are located.

You can choose from several possible network configurations when using WEB HMI screens to monitor control applications. You can also run screens on virtual targets for simulation purposes. For information on possible network configurations or running screens on virtual targets, refer to the *Using WEB HMI Screens* application note.

To start the WEB HMI Screen Builder

➤ From the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **WEB HMI Screen Builder**.

To set up a WEB HMI data server

1. Install and license the WEB HMI data server on the target node.

   For information on installing and licensing on target nodes, see "Installation Procedures on Target Nodes", on page 9.

2. From the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Workbench**.

3. In your Workbench project, right-click the title bar of the configuration having variables to be accessed by the data server.

   The Advanced Options for configurations window appears.

4. Select the Data Server tab.

5. To enable the data server for the configuration, check Enable Server.

6. In the Server Properties section, define the polling period and a password (optional).

7. In the Network Access section, define the connections to other configurations.

   a) From the list of available configurations, locate a configuration to connect to the data server.

   b) In the Network list, click its corresponding field.

   c) From the list of available network connections and the IP addresses, select one.

8. Click **OK**.

To view a screen

The computer on which you view screens must have a TCP/IP connection to the target where the data server runs and the screen was downloaded.

1. Start a Java-technology enabled browser.

2. In the Address field, enter the following line:
   http://*IP_address_of_target_node*/*screen_name*.html

3. Click **OK**.

The screen appears in the browser.

How to Create a Control Application

When you work with **ISaGRAF Enhanced**, it is very likely that your project will use the Workbench with the HMI. To build such a project, you have to follow a predefined set of steps.

After having created an application, you should perform regular backups of the files making it up:

Note: The paths indicated may differ if you installed **ISaGRAF Enhanced** components or files in a directory other than the default one.

! Workbench projects, located in the following directory:
My Projects\ISaGRAF Enhanced\Workbench\Prj*project_name*

! HMI projects, located in the following directory:
My Projects\ISaGRAF Enhanced\Hmi*project_name*

! Trends historical data, located in the following directory:
My Projects\ISaGRAF Enhanced\Trends*project_name*

! Alarms projects, located in the following directory:
My Projects\ISaGRAF Enhanced\Alarms*project_name*

! Infolink.ini files, located in the following directory of each computer having a Trend Link Control accessing the trends database:
Program Files\ISaGRAF Enhanced\Trends\shared\INFOLINK.INI

Warning: The list of application files for which you should perform regular backups may not be exhaustive depending on which features of ISaGRAF Enhanced have been used in your applications. You should restore your application backup to ensure its completeness.

To build a project using the Workbench and HMI

1. Install **ISaGRAF Enhanced**.

2. Build a control project with the Workbench.

3. Download the project onto target nodes with the Workbench.

4. Configure the VM OPC DA server (see page 46).

5. Connect the HMI with the VM OPC DA server.

6. Create user interfaces with the HMI.

Optional Functions and Function Block Packs

Optional packages, also called packs, of specialized functions and function blocks are available for use in **ISaGRAF Enhanced**. These files are sent to you following their purchase. For Windows NT and Windows 2000 targets, the available optional packs only require licensing. For details on licensing **ISaGRAF Enhanced** components, see page 64. Documentation for all packs is included in the online **ISaGRAF Enhanced** User's Guide. Available packages include:

! Serial Communications functions, providing access to remote equipment through asynchronous communication ports

! ODBC (Open DataBase Connectivity) functions, providing access to a Windows ODBC driver manager via NT_TARGET run-time modules

! Smart PID function block, a self-modeling controller modeling the relationship between the feedforward and process it controls

Note: For details on the availability of optional packs for the different target operating systems, contact ICS Triplex ISaGRAF Inc' sales personnel. For details on contacting sales, see page 66.

To install the Serial Communications

1. Copy the .v2k file corresponding to the optional pack in the /temp directory then double-click it.

   The Project Updater appears then updates your database.

2. When the Project Updater execution terminates, close the window.

3. In the **ISaGRAF Enhanced** Run-time Installation window, enter the required information for the target node.

Note: If you installed the target operating system using the installation medium provided with **ISaGRAF Enhanced**, a default user name and password are created: *Virgo2000* and *v2000* respectively. You can use either these defaults or any others you created on your target node.

4. Click **Start**.

    The functions are downloaded to the target node when the status bar, at the bottom of the window, reads Procedure completed.

5. To install the optional pack onto another target node, repeat steps 3 and 4.

6. To exit the Run-time Installation window, click **Cancel**.

To install the ODBC pack

▶   Choose the ODBC pack in the **ISaGRAF Enhanced** installation option, then license it through the License Manager.

    For details on licensing components, see page 64.

To install the Smart PID pack

1. Copy the .v2k file corresponding to the optional pack in the /temp directory then double-click it.

    The Project Updater appears then updates your database.

2. When the Project Updater execution terminates, close the window.

Documentation Set

This *Getting Started* guide is part of the **ISaGRAF Enhanced** documentation set; an online copy (in PDF format) can be accessed from the **ISaGRAF Enhanced** Installation window or from the Start menu of windows, by choosing **Program Files**, then **ISaGRAF Enhanced**, then **Help**, then **Getting Started**. The other components of this set are:

! *User's Guide*, in an online format (HTML) or PDF format, that you can print, helping you in your step-by-step operations. For the online format, you access it from within the software itself or from the Start menu of windows, by choosing **Program Files**, then **ISaGRAF Enhanced**, then **Help**, then **Help Guide**. For the PDF format, you access them in the following directory:
Program Files\ISaGRAF Enhanced\Documentation\Users Guide

! *Hands On* guide, in an online format (HTML), walking you through an existing application and guiding you in the development of a simple or distributed application, accessed from the Start menu of windows, by choosing **Program Files**, then **ISaGRAF Enhanced**, then **Help**, then **Hands On**.

! *Drivers*, in online format (PDF), presenting the available fieldbus protocol drivers. These PDF files are located in the following directory:
Program Files\ISaGRAF Enhanced\Documentation\Drivers

! *Release Notes*, in online format (text), containing the latest information on **ISaGRAF Enhanced**, are located at the root of **ISaGRAF Enhanced** or from the Start menu of windows, by choosing **Program Files**, then **ISaGRAF Enhanced**, then **Help**, then **Release Notes**.

! *Application Notes*, in online format (PDF), providing detailed information for various aspects of **ISaGRAF Enhanced**. These PDF files are located in the following directory:
Program Files\ISaGRAF Enhanced\Documentation\App Notes.

You read PDF (Portable Document Format) documents using Adobe Acrobat Reader 4.0 or later. This software is included on the **ISaGRAF Enhanced** CD-ROM, in the Acrobat Reader directory.

How to Use Online Help

When working inside **ISaGRAF Enhanced**, you have access to online help. You can also access the online modules from the Windows Start menu, by choosing **ISaGRAF Enhanced**, then **Help**, then **Help Guide**.

From the Workbench, you get help on the currently displayed environment by choosing the Help>Contents command.

From the Alarms and Events Notification Setup module, you get help by choosing Help>Help Topics.

From the Trend Link Control, you get help by right-clicking on the control, then from the contextual menu, choose **Properties**, then in the Properties Pages window, pressing **Help**. You can reach the Trend Link scripting language reference from the table of contents of the help modules.

From the Driver Monitor, you get help on the currently displayed environment by choosing the Help>Contents command or pressing F1.

From the WEB HMI Screen Builder, you get help by choosing the Help>Contents command.

System Requirements for Development Platforms

Minimum Requirements

To use **ISaGRAF Enhanced**, you need the following hardware and software:

- ! A computer with a Pentium or compatible processor, running at 166 MHz
- ! 64 MB of RAM
- ! A hard disk with 300 MB of free space (once the operating system is installed)
- ! A CD-ROM drive on the Windows network, for installation purposes only
- ! A VGA monitor having at least 800 X 600 pixels screen resolution
- ! The Windows NT version 4.0 operating system with SP (Service Pack) 6A, Windows 98 SE, Windows 2000 with SP 2 (with Power User priveleges), or Windows XP. To run the alarms server, you need a computer running Windows NT with SP 6A or Windows 2000 with SP 2.
- ! A serial port or the TCP/IP network
- ! Microsoft Internet Explorer 5.01

Additional Recommendations

For optimal performance, ICS Triplex ISaGRAF Inc recommends the following hardware:

- ! A computer with a Pentium II or compatible processor, running at 450 MHz or higher
- ! 128 MB of RAM
- ! A hard disk with 1 GB of free space
- ! An SVGA monitor
- ! An Ethernet adapter (instead of a serial port)

System Requirements for Target Platforms

The currently available operating systems for target nodes are Windows NT, Windows 2000, the Linux kernel version 2.2.16 with RTAI version 1.7, QNX real-time version 4.25, and Windows CE 3.0.

VM Windows NT

Minimum Requirements

Targets need the following hardware and software:

! The Windows NT version 4.0 operating system with SP (Service Pack) 6A, or Windows 2000 with SP 2 (with Power User priveleges)

! A computer with a Pentium or compatible processor, running at 166 MHz

! 64 MB of RAM

! A hard disk with 200 MB of free space (once the operating system is installed)

! A monitor, a keyboard, and a CD-ROM drive for installation purposes

! A serial port or the TCP/IP network

Currently, only the Windows 2000 operating system is available from Microsoft.

Additional Recommendations

For larger applications, ICS Triplex ISaGRAF Inc recommends the following hardware:

! A computer with a Pentium II or compatible processor, running at 450 MHz or higher

! 128 MB of RAM

- ! A hard disk with 300 MB of free space (once the operating system is installed)
- ! An Ethernet adapter (instead of a serial port)

VM RTAI Linux Run-time

Minimum Requirements

Targets need the following hardware and software:

- ! The Linux kernel version 2.2.16 (modified with the RTHAL patch included in the RTAI package)

- ! RTAI version 1.7 with ICS Triplex ISaGRAF Inc modifications on the LXRT module

- ! A computer with an Intel 80386 with mathematical co-processor, or compatible platform.

- ! 16 MB of RAM

- ! 4 MB free persistent storage (after Linux installation) which means approximately 16 MB free storage without Linux

- ! A monitor, a keyboard, a diskette drive, and a CD-ROM drive for installation purposes

- ! A Telnet server

- ! An FTP server

- ! To use a failover mechanism, an RTNet module/driver version 0.9.0

The RTAI Linux operating system is provided by ICS Triplex ISaGRAF Inc.

Additional Recommendations

For larger applications, ICS Triplex ISaGRAF Inc recommends the following hardware:

- ! 32 MB for VM RTAI Linux Run-time executable and configuration files
- ! A minimum of 100 MB of free Program memory

VM QNX Run-time

Minimum Requirements

Targets need the following hardware and software:

- ! A computer with an Intel 80386, or compatible processor
- ! 32 MB of RAM
- ! 200 MB of total space for a typical installation using the QNX MOMENTICS 6.2.1A package
- ! A monitor, a CD-ROM drive, and a keyboard for installation purposes
- ! A serial port and the TCP/IP network

The QNX operating system is available from QNX Software Systems Ltd.

Additional Recommendations

For larger systems, ICS Triplex ISaGRAF Inc recommends the following hardware:

- ! A computer with a Pentium, or compatible processor, running at 200 MHz
- ! 64 MB of RAM
- ! A hard disk or flash disk with 250 MB of total space
- ! An Ethernet adapter (instead of a serial port)

VM CE Run-time

Minimum Requirements

Targets need the following hardware and software:

- ! Windows CE version 3.0 on a CEPC platform type. (Other Windows CE 3.0 platforms can be tested and delivered upon request).

- ! A computer with an Intel 80486 or compatible processor. A mathematical co-processor is recommended for performance. (Other processors can be tested and delivered upon request)

- ! The TCP/IP network

- ! 4 MB of free space for VM CE Run-time, executable, and configuration files

- ! An ActiveSync 3.0 connection between the Windows CE device and the development workstation for VM CE Run-time installation. Alternatively, installation instructions and the necessary files can also be delivered for manual installation or to integrate VM CE Run-time in the Windows CE ROM image.

- ! 16 free process slots (No more than 15 processes other than VM CE Run-time can be running simultaneously on the Windows CE platform)

- ! 2 MB of free Program memory for small applications

The Windows CE operating system is available from Microsoft.

Additional Recommendations

For larger applications, ICS Triplex ISaGRAF Inc recommends the following hardware:

- ! 8 MB for VM CE Run-time executable and configuration files

- ! A minimum of 4 MB of free Program memory

Installation Procedures on Development Platforms

You can install **ISaGRAF Enhanced** using a CD-ROM or files downloaded from the ICS Triplex ISaGRAF Inc website. From the **ISaGRAF Enhanced** CD-ROM, you can choose to install three items:

!   **ISaGRAF Enhanced**

!   Internet Explorer 5.01. Upgrades to versions 5.5 and 6.0 are also available.

!   Acrobat Reader, required to view driver documentation, application notes, and the paper version of the online documentation

To use ISaGRAF Enhanced CE components, you need to install ActiveSync 3.0. ActiveSync 3.0 is available at the root of the **ISaGRAF Enhanced** CD-ROM or you can download it from www.microsoft.com/downloads/release.asp?ReleaseID=31684&area=search&ordinal=1. When installing ActiveSync 3.0 after installing ISaGRAF Enhanced CE components, you must run batch files located in the Program Files\ISaGRAF Enhanced\Windows CE PC\ directory.

When upgrading to the latest version of **ISaGRAF Enhanced**, you need to uninstall all previous **ISaGRAF Enhanced** programs, service packs, and shared DLL files. The **ISaGRAF Enhanced** CD-ROM includes the Uninstaller which removes these programs. Furthermore, when opening existing projects in the more recent version, you will be prompted to convert them.

After installing **ISaGRAF Enhanced**, read the release notes included with the product. These are located at the root of **ISaGRAF Enhanced**.

To install ISaGRAF Enhanced from CD-ROM

ICS Triplex ISaGRAF Inc recommends using all default folder destinations.

1. If you use Windows NT, log in with a user name having administrator rights.

2. Place the **ISaGRAF Enhanced** CD-ROM in the drive.

Note: During the installation process, your computer will restart. You need to leave the CD-ROM in the computer's drive throughout the entire process.

3. Do one of the following steps:

    ▪   If autorun is enabled on your computer, proceed to step 4.

    ▪   If autorun is not enabled on your computer, in Windows Explorer, locate the **ISaGRAF Enhanced** CD-ROM and double-click **Setup.exe** (in the root directory).

4. On the installation window, click once on the **ISaGRAF Enhanced** option.

5. Follow the on-screen instructions.

6. When the installation is complete, restart your computer.

To install a downloaded version of ISaGRAF Enhanced

From the ICS Triplex ISaGRAF Inc website, you can download **ISaGRAF Enhanced** as three executable files: Objects Update, **ISaGRAF Enhanced**, the product documentation, and the add-ons. You can also download it as a single executable file including the Objects Update.

Note: If you intend to create an installation CD-ROM for **ISaGRAF Enhanced**, note the location where all files are unzipped.

1. If you use Windows NT, Windows 2000, or Windows XP, log in with a user name having administrator rights.

2. Download the necessary files from the Download Center at http://www.altersys.com/resources/download_center.asp

3. If you downloaded the full version, locate and double-click the ISaGRAF Enhanced 2.41 Full.exe file. Otherwise, proceed to step 4.

    The Winzip Self extractor dialog appears and you choose to Unzip the file while noting the location where the file is unzipped into a folder holding the four executable files making up the product.

4. Install **ISaGRAF Enhanced**:

    a) Locate and double-click the downloaded ISaGRAF Enhanced 2.41.exe file.

    b) When asked if you want to install, click **Yes**.

        The Winzip Self-extractor dialog appears.

    c) Click **Unzip**.

        The **ISaGRAF Enhanced** files are unzipped, then the **ISaGRAF Enhanced** installation automatically starts up.

    d) Follow the on-screen installation instructions.

5. To install the Objects Update:

    a) Locate and double-click the downloaded Objects Update.exe file.

    b) When asked if you want to install, click **Yes**.

        The Winzip Self-extractor dialog appears.

    c) Click **Unzip**.

        The Objects Update files are unzipped, then the Objects Updates installation automatically starts up.

    d) Follow the on-screen installation instructions.

    e) Return to the **ISaGRAF Enhanced** installation.

6. To install the documentation or the add-ons:

    a) Locate and double-click the downloaded file.

        For the documentation, the filename is Documentation.exe. For the add-ons, the filename is Add-ons.exe.

    b) When asked if you want to install, click **Yes**.

        The Winzip Self-extractor dialog appears.

    c) Click **Unzip**.

        The files are unzipped and placed in the following respective folders:

        ▪ Program Files/ISaGRAF Enhanced/Documentation

        ▪ Program Files/ISaGRAF Enhanced 2.41 CD-ROM/ Add-ons

ISaGRAF Enhanced is ready for use. For details on creating an installation CD-ROM, refer to the istructions available on the ICS Triplex ISaGRAF Inc web site's Download Center.

Licensing ISaGRAF Enhanced Components

You can use the Workbench, HMI, Windows NT target runtime, and Trends for a trial period of 30 days before requiring licensing. You can also use the Windows NT target drivers (I/O Port, Modbus, and Open Modbus IP) for this trial period. When not licensed, the Alarms Server (logger) only operates for periods of one hour and only the first symbols from each category are available in the Symbol Library. To have a fully operational version of the product, you need to license it.

For details on licensing components, refer to the online documentation.

The Workbench, Trends, and WEB HMI Screen Builder are available as feature sets. For the Workbench, the available sets are:

! Essential, one Workbench and one run-time module running a single virtual machine having either a specific quantity of I/Os ranging between 1 and 4095 or an unlimited quantity

! Multiscan, one Workbench and one run-time module running multiple virtual machines having either a specific quantity of variables ranging between 100 and 50000 or an unlimited quantity

! Distributed, one Workbench and multiple run-time modules running multiple virtual machines having either a specific quantity of variables ranging between 100 and 50000 or an unlimited quantity

! Monitoring, read-only capabilities enabling the downloading and debugging of a target but not editing or building a project. This feature set can view Essential, Multiscan, and Distributed project types.

For Trends, the available sets are Basic and Professional. The Professional set includes a viewer displaying an unlimited number of trends and much more. For the WEB HMI Screen Builder, the available sets are one resource having up to 128 variables, one resource having an unlimited number of variables, one configuration, or unlimited.

Although licenses are only valid on a single computer, you can transfer them from one computer to another.

On Windows NT or Windows 2000 target platforms, you need to license components such as trends servers, events servers, communication drivers, and optional functions and function block packs.

Technical Support

Contacting Us

For technical support on **ISaGRAF Enhanced**, visit our web site at http://www.icstriplexisagraf.com or contact our location nearest you:

North America

- ! Send an e-mail to support@icstriplex.ca
- ! Send a fax to +1 450 674-7344
- ! Call +1 450 674-7774, press 9 for service in French
- ! Call toll free +1 877 868-4746, press 9 for service in French
- ! Write to us:

  ICS Triplex ISaGRAF Inc.
  Technical Support
  555, d'Auvergne Street
  Longueuil (Quebec)
  Canada
  J4H 4A3

For sales personnel, call 1 877 868-4746 or send an e-mail to sales@icstriplex.ca.

Europe

- ! Send an e-mail to supporteurope@icstriplex.ca
- ! Send a fax to +33 (0)4 76 41 35 61
- ! Call +33 (0)4 76 04 81 75

! Write to us:

ICS Triplex ISaGRAF Inc.
Technical Support
21 Chemin des Prés
38240 Meylan ZIRST
France

For sales personnel, call +33 (0)4 76 04 81 75 or send an e-mail to sales@icstriplex.ca.

Reporting a Problem

If you encounter problems when using **ISaGRAF Enhanced**, you can report them to us so we can investigate them and get back to you quickly. During the **ISaGRAF Enhanced** installation, a small utility program, called Solobug, was copied on your computer. It allows you to create problem reports that you send by e-mail.

The Solobug utility comes with online help, a user manual in PDF format, and a readme.txt file. All Solobug files are located in the following directory: Program Files\ISaGRAF Enhanced\Error Reporting.
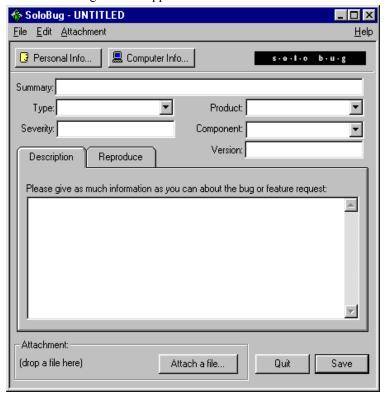
The Solobug implementation in **ISaGRAF Enhanced** has been customized to allow ICS Triplex ISaGRAF Inc' technical support personnel to better understand the problem you are reporting. Therefore, the list of fields you have to fill in is different than in the user manual. These fields are:

Field	Description
Summary	Short description of the problem
Type	Gravity of the problem
Severity	*to be left empty*
Product	**ISaGRAF Enhanced**
Component	Name of the **ISaGRAF Enhanced** component that is causing the problem. You can leave this field empty or select **Unknown**.
Version	Version number for **ISaGRAF Enhanced**. This number is located on the image appearing when you start **ISaGRAF Enhanced**.
Description	Detailed reporting of the problem
Reproduce	Series of steps to reproduce the problem

To create a problem report with Solobug

1. In the Start menu of Windows, choose **Programs**, then **ISaGRAF Enhanced**, then **Problem Reporting**, then **Solobug**.

    The Solobug window appears.

2. The first time you use Solobug, click **Personal Info** then enter your identification information.

    This information will be recorded by Solobug.

3. The first time you use Solobug, click **Computer Info** then enter your computer setup.

    This information will be recorded by Solobug.

4. Fill in the fields describing the problem.

5. Save the problem report then exit Solobug.

   Solobug uses the .sbg file extension to save each problem report.

6. In your e-mail software, create a message addressed to ICS Triplex ISaGRAF Inc' technical support personnel at support@icstriplex.ca and attach the Solobug file in it.